

THINKING GLOBALLY, ACTING LOCALLY

York Region reducing corporate GHG emissions



JOHN SHERIN is Manager of Climate Change and Energy Conservation at the Regional Municipality of York. He manages all aspects of corporate energy services, which includes strategic energy procurement, conservation and demand management studies and plan development, as well as developing and implementing energy-efficient standards for regional buildings. He can be reached at <john.sherin@york.ca>.

BILL CHIHATA, P.Eng., MBA, CEM, LEED GA has 20+ years of experience in energy and water conservation. Working for the Regional Municipality of York's Environmental Services Department, he leads several water and energy conservation programs and strategies. He also teaches Energy Management courses at Seneca College as part of the Built Environmental System (BES) certification program. He can be reached at <bill.chihata@york.ca>.

The Regional Municipality of York, an upper-tier municipality located on the northern border of Toronto, is home to 1.2 million people and is one of the fastest growing municipalities in Ontario. Designated as a regional growth centre in the province's *Places to Grow Act, 2005*, the region is expected to be home to 1.79 million people by 2041. This rising population growth will lead to an increased demand for services and result in a greater output of regional corporate greenhouse gas (GHG) emissions.

Looking to the future, York regional council endorsed Vision 2051, a long-

term strategy that inspires the organization to move "toward zero greenhouse gas emissions by 2051." To achieve this aspirational goal, staff developed the 2016 Energy Conservation and Demand Management Plan detailing how the region will achieve long-term sustainability and demonstrate leadership through its own actions and commitments. The plan is a collaborative effort outlining how each regional service area will take steps to reduce corporate GHG emissions, while still meeting the increasing demand for services due to forecasted population growth. Once realized, the region will reduce its 2051 GHG emissions



Leading GHG Reduction Initiatives in York Region

Electric Transit Buses

Transit buses are the single largest contributor to the region's carbon footprint, typically representing half of all annual corporate GHG emissions. However, transit buses reduce the number of single occupant vehicles on the road, which offsets a large portion of the buses' own emissions and helps reduce traffic congestion. Beginning in 2016, the region's transit fleet embarked on a plan to make current vehicles more fuel efficient by introducing topography sensitive transmission software, replacing hydraulic cooling fans with electric, and adding software that provides drivers with immediate feedback on how efficiently they are operating the vehicle.

Starting in early 2018, York Region Transit will pilot fully electric buses on two of its bus routes in the Town of Newmarket. Results from this pilot have the potential to reduce the region's annual GHG emissions by over 40,000 tonnes each year and may become a model for transit systems throughout the province.

Buildings

York Region has had a sustainable building policy in place since 2006. In addition to rigorous technical building standards, all regional buildings with a floor area over 500m² are required to achieve a minimum Leadership in Energy and Environmental Design (LEED) Silver certification. To date, the region has 15 buildings that have achieved LEED certification (one Platinum, five Gold, eight Silver and one Certified) and another nine in various stages of construction or design that are expected to achieve at least a LEED Silver certification. The region has also constructed the Bill Fisch Forest Stewardship and Education Centre, a building designed to have a net-positive environmental footprint, and earning Petal certification under the Living Building Challenge, one of the most stringent certifications in the world. To date, the building has earned four Petals under Living Building Challenge.

Certifications and third-party validations are just the first step in achieving efficient buildings. Maintaining long-term sustainability requires a continuous process of analysis, adjustment, and retrofitting of facilities. Over time a building's energy performance will "drift" due to changes in usage, technologies, building modifications, and occupant habits. The region will employ on-going commissioning as part of a continuous process of ensuring optimal performance of its buildings.

Fleet Vehicles

York Region operates a fleet of vehicles including police cars, ambulances, and trucks. Even with emergency vehicles (e.g., police and paramedic) that have strict service delivery requirements, technologies exist to reduce greenhouse gas emissions. Idling is sometimes necessary for these vehicles to maintain the temperature of medicines or to operate onboard computers. Anti-idling technologies, installed on the region's ambulances, have reduced engine idle time in six months by almost 20 percent, saved 11,000 litres of fuel, and prevented 27.9 tonnes of GHG emissions entering the atmosphere. The region is also piloting hybrid electric powertrain technology that will turn a conventional ambulance into a hybrid electric vehicle further reducing greenhouse gas emissions from ambulance operation by 19 percent per year.

Water and Wastewater Processing

The region initiates and leads a wide range of innovative water and wastewater process-related energy efficiency projects to achieve energy neutrality.

Using data collected by the water and wastewater pumping controls system (SCADA), a pilot study identifying the optimal sequence of pump operation reduced annual energy consumption by an estimated two percent per year. Feasibility studies have identified opportunities to recover some of the electricity consumed for pumping by installing micro-hydro turbines where topography would normally require a pressure relief valve to dissipate excess system pressure. Given the amount of electricity consumed by water and wastewater pumping, these savings are anticipated to be significant for the region.

The region is also involved in a number of innovative renewable energy projects. The most recent is heating process water from thermal energy recovered from wastewater effluent. A feasibility study was completed early in 2017, which determined a larger project of this nature would reduce electrical demand, electrical consumption, and GHG emissions from the facility while having a payback period of less than 10 years (using current electricity rates). The region is also implementing non-process-related initiatives, such as retrofitting facilities with LED lighting, retrofitting building heating systems, and installing solar panels at water and wastewater sites.

by 47 percent compared to its benchmarked 2014 emissions level.

Where to start?

In 2014, the region's corporate GHG emissions amounted to 89,957 tonnes. These emissions were the result of a variety of service activities (from ambulance and police car tailpipe exhaust, to electricity for water and wastewater pumping and processing). The common thread linking regional emissions is how services are delivered. Every regional service contributes to corporate GHG emissions from at least one of the following four categories:

- **buildings** – electricity and natural gas for heating, cooling, ventilation, and lighting;
- **water and wastewater** – electricity and natural gas for treatment and pumping;
- **non-transit fleet vehicles** – tailpipe exhaust emissions from police cars, ambulances, construction vehicles, and personal vehicle use for corporate business; and
- **transit vehicles** – exhaust stack emissions from buses.

With the region's overall challenge divided into four manageable components, stakeholders from every department were invited to discuss next steps.

Team work is the best work

During department stakeholder meetings, staff quickly realized every service area in the region was already implementing greenhouse gas reducing initiatives, not as part of any instruction or strategy, but because staff knew it was the right thing to do. The initiatives and ideas proposed by staff identified a clear roadmap that the region's service delivery areas could take to reduce corporate GHG emissions. Far from being top-down, the plan was being driven from the bottom-up. Because staff were truly leading this initiative, buy-in was immediate, easy, and attainable. Additionally, it created a healthy and amicable level of competition and innovation across different regional service areas.

Council endorsed plan with achievable targets

Setting interim targets (and check points) for 2021, 2031, and 2041 ensures the long-term 2051 target adapts to emerging conditions and remains a staff priority. With strong enthusiasm at the outset, it is also important to focus on execution and interim successes, otherwise the goals will remain aspirational. Guided by the council endorsed Energy Conservation and Demand Management Plan, staff steering committees provide direction to working groups that are formed to implement individual ini-

tiatives. Council receives the corporate energy report annually, which compares the region's actual emissions to plan targets.

Building Capacity for a Sustainable Future

It is a reality that not everyone who starts this long-term plan will still be working at the region when sustainability is realized. Nor will everyone who finishes the plan have been with the region at its inception. Along the way, sustaining buy-in and engagement from all involved staff is key to long-term suc-

cess. It is important that each generation of staff passes the mantle to the next. To achieve this goal, York Region will use its legislated obligation as directed by Ontario Regulation 397/11 (Broader Public Sector Reporting) to update the plan at five-year intervals as a means to engage staff and consider new and emerging technologies that will further reduce its carbon footprint. This process of renewal will ensure that the Energy Conservation and Demand Management Plan is a living document relevant today, and in the future, when the region's Vision 2051 is a reality. **MW**

as published in

Municipal World

CANADA'S MUNICIPAL MAGAZINE – SINCE 1891

1-888-368-6125

www.municipalworld.com